

Hooray for Left-overs! by Tessa Jupp RN

You may have seen an item on the **Channel 7 News 28 Sept 2015** about **new Australian research** that has produced a powder to be made into a twice daily drink **to help diabetics to reduce blood sugar**. The results of scientific trials undertaken with a \$2 million Australian Research Council Grant to Macquarie Uni and the Royal Melbourne Hospital, published in Nov 2014, show that this natural hard-to-digest fibre-mix lowers blood sugar and encourages the growth of good intestinal bacteria in the large bowel.

The cost of this product, "**NutriKane D**" is **\$42** for a **fortnight's supply**. Taken morning and night, it **contains the fibre of sugar cane** from which most of the sugar has been removed and the addition of apple pectin, citric acid, potassium bicarb, stevia and a natural orange flavouring. The **sugar cane** is also **high in bioavailable Chromium**. It has a food classification –ie not a drug.

The basis of this work is the function in the diet of "resistant starch". We get starch in carbohydrate (ie plant) foods.

Other research I have come across that can easily be found with an internet search, has looked at the relevance of food preparation, cooking and storage in release of blood sugar.

Basically, there are a number of ways we can lessen sugar spikes from the combinations of foods we eat. Protein with veg or grains is one way. But foods that may have a high GI index can be changed by what we do with food, and how and when we eat it. All starches ultimately end up as basic sugar to fuel the body but when that is available can be changed.

DIGESTIVE SYSTEM

Mouth: we chew food and alkalise it with saliva for carbs.

Stomach: Acid is added to break down protein foods. Flour, ie **processed foods** made from cooked crushed grains & veg and soft fruits, quickly turn to sugars which gives a spike.

Soluble fibre, ie oatmeal & bran, cereals, lentils, fruit pulp, soft nuts, cooked veg, psyllium, all attract water and swell, slowing down the emptying of the stomach of everything.

Insoluble fibre, ie whole grains, seeds, hard nuts, uncooked salad veg and tough skinned fruit, don't swell so speed up the passage of food through the gut but don't release sugar.

Resistant starch, raw veg and unripe fruit, is indigestible so passes through to the large bowel pretty much intact.

Small intestine: Progress is still fast or slow accordingly as above, with the addition of bile, pancreatic enzymes and bicarb working on further breakdown and enabling absorption of the various vitamins, minerals and amino acids at their appropriate absorption sites as well as protein & carbs.

Large bowel: Here is a whole new world and this is where **Probiotics** come in. The **indigestible fibres** and **starch** **provide the food for these gut bacteria**, keep them healthy and they in turn **feed the cells lining the gut**, thus keeping them in good conditions and **so preventing bowel cancer**. The **short-chain fatty acids** made by these gut bacteria **provide a later "2nd Meal"** into the blood stream as well.



RESISTANT STARCHES reduce blood sugar

Type 1. Starch that is difficult for the digestive process to reach, often due to a fibrous "shell". **Grains and legumes** which are **cooked intact** are an example. **Seeds, nuts and sweetcorn** also

come under this category. Some altered starches, such as Hi-Maize corn starch, are in both this category, and the next.

Type 2. Some foods, such as **peas**, unripe bananas, **raw potatoes** and other **raw root veg & nuts**, have a type of starch which our digestive enzymes can't break down but gut bacteria can.

Type 3. Small amounts of resistant starch (about 5% of the total) are produced when some starchy cooked foods, such as **toast, potatoes, pasta and rice**, are **allowed to cool** before eating. **Freezing before re-heating is even better!**

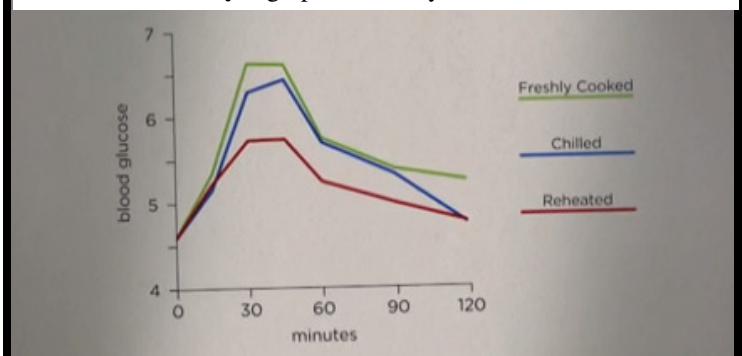
Amazingly, UK research has shown that **freezing bread** up to 30 days doubles its resistant starch content. **So does toasting**. Even better if frozen then toasted! It slows down the release of blood sugar that is a problem with fresh bread.

Swedish studies on potatoes showed that **cooked potato is better cold the next day** eg **potato salad, cold roast potato, sliced fried potatoes, Bubble and Squeak** (left-over veg fried) **for breakfast**, cold mashed potato made into fish patties & rissoles - or raw potato grated to make Mock Fish!



An **Italian study** I found on **pasta**, gave the example where the Italian norm was to eat pasta fresh on Day 1, cold on Day 2 and reheated on Day 3. See chart below. There are similar charts for **freezing and toasting bread** and **adding vinegar** to meals.

Italian Pasta Study - graph on freshly cooked, chilled, reheated



Question: If cooling cooked starches (eg potato, rice, pasta, bread, beans) increases resistant starch, **will reheating destroy it?**

Answer: Not only does it not destroy, but successive cooling and reheating actually **increases the resistance** of the starch.

So there is value in using left-overs to make other meals. The "2nd Meal" slowing effect lasts several days so do try to have some of these "**resistant**" foods at least every 2nd day.